

# BOTTOM, CHARMED MESONS

## ( $B = C = \pm 1$ )

$$B_c^+ = c\bar{b}, B_c^- = \bar{c}b, \text{ similarly for } B_c^* \text{'s}$$

$B_c^+$

$$I(J^P) = 0(0^-)$$

$I, J, P$  need confirmation.

Quantum numbers shown are quark-model predictions.

Mass  $m = 6274.9 \pm 0.8$  MeV

Mean life  $\tau = (0.510 \pm 0.009) \times 10^{-12}$  s

$B_c^-$  modes are charge conjugates of the modes below.

$B_c^+$ DECAY MODES $\times B(\bar{b} \rightarrow B_c)$	Fraction ( $\Gamma_i/\Gamma$ )	Confidence level	(MeV/c) $p$
The following quantities are not pure branching ratios; rather the fraction $\Gamma_i/\Gamma \times B(\bar{b} \rightarrow B_c)$ .			
$J/\psi(1S)\ell^+\nu_\ell$ anything	$(8.1 \pm 1.2) \times 10^{-5}$		-
$J/\psi(1S)\pi^+$	seen		2371
$J/\psi(1S)K^+$	seen		2341
$J/\psi(1S)\pi^+\pi^+\pi^-$	seen		2350
$J/\psi(1S)a_1(1260)$	$< 1.2 \times 10^{-3}$	90%	2169
$J/\psi(1S)K^+K^-\pi^+$	seen		2203
$J/\psi(1S)\pi^+\pi^+\pi^+\pi^-\pi^-$	seen		2309
$\psi(2S)\pi^+$	seen		2052
$J/\psi(1S)D^0K^+$	seen		1539
$J/\psi(1S)D^*(2007)^0K^+$	seen		1412
$J/\psi(1S)D^*(2010)^+K^{*0}$	seen		920
$J/\psi(1S)D^+K^{*0}$	seen		1123
$J/\psi(1S)D_s^+$	seen		1822
$J/\psi(1S)D_s^{*+}$	seen		1728
$J/\psi(1S)p\bar{p}\pi^+$	seen		1792
$\chi_c^0\pi^+$	$(2.4 \pm 0.9) \times 10^{-5}$		2205
$p\bar{p}\pi^+$	not seen		2970
$D^0K^+$	$(3.8 \pm 1.2) \times 10^{-7}$		2837
$D^0\pi^+$	$< 1.6 \times 10^{-7}$	95%	2858
$D^{*0}\pi^+$	$< 4 \times 10^{-7}$	95%	2815
$D^{*0}K^+$	$< 4 \times 10^{-7}$	95%	2793

$D_s^+ \overline{D}^0$	$< 1.4$	$\times 10^{-7}$	90%	2484
$D_s^+ D^0$	$< 6$	$\times 10^{-8}$	90%	2484
$D^+ \overline{D}^0$	$< 3.0$	$\times 10^{-6}$	90%	2521
$D^+ D^0$	$< 1.9$	$\times 10^{-6}$	90%	2521
$D^*(2010)^+ \overline{D}^0$	$< 6.2$	$\times 10^{-3}$	90%	2467
$D_s^{*+} \overline{D}^*(2007)^0$	$< 1.7$	$\times 10^{-6}$	90%	2366
$D_s^{*+} D^*(2007)^0$	$< 3.1$	$\times 10^{-6}$	90%	2366
$D^*(2010)^+ \overline{D}^*(2007)^0$	$< 1.0$	$\times 10^{-4}$	90%	2410
$D^*(2010)^+ D^*(2007)^0$	$< 2.0$	$\times 10^{-5}$	90%	2410
$D^+ K^{*0}$	$< 0.20$	$\times 10^{-6}$	90%	2783
$D^+ \overline{K}^{*0}$	$< 0.16$	$\times 10^{-6}$	90%	2783
$D_s^+ K^{*0}$	$< 0.28$	$\times 10^{-6}$	90%	2751
$D_s^+ \overline{K}^{*0}$	$< 0.4$	$\times 10^{-6}$	90%	2751
$D_s^+ \phi$	$< 0.32$	$\times 10^{-6}$	90%	2727
$K^+ K^0$	$< 4.6$	$\times 10^{-7}$	90%	3098
$B_s^0 \pi^+ / B(\overline{b} \rightarrow B_s)$	$(2.37^{+0.37}_{-0.35}) \times 10^{-3}$			—